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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,526	12/18/2001	Johan Nilsson	47253-00034	6219

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EXAMINER	
LE, DUY K	

ART UNIT	PAPER NUMBER
2685	

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/025,526	NILSSON ET AL.	
	Examiner	Art Unit	
	Duy K Le	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☒ Claim(s) *2,5,11,15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5,10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 2, 5, 11, and 15 are objected to because of the following informalities:

   a. In claims 2 and 15, a misspelling "intea" should be corrected to –intra–.

   b. In claim 5, "(2+6)" on line 3 of the claim should be removed.

   c. In claim 11, the word "inter" on line 4 should be changed to –intra–.

   Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Bergstrom et al. (U.S. Patent 6,131,013).

As to claim 1 (CURRENTLY AMENDED), Figure 1 in Bergstrom shows a mobile communications terminal (304) for use in a cellular communications system, comprising an electronic circuit (314) for receiving a wire-less communications signal carrying signal channels having processing means for extracting the signal channels ("the receiver 304 includes an interference classifier 314, an interference suppressor 316, and a demodulation/decoding unit 318. The receiver 304 receives the signal from the channel 306 in a signal receptor (not shown),

such as an antenna. The interference classifier 314 analyzes the signal received from the channel 306 and identifies and classifies interference components within the signal" (Col. 3, lines 39-45)); and

wherein the electronic circuit (314) is adapted to classify a type of interference, affecting the communications quality, by evaluating signals selected in the electronic circuit that are selected as signals having information for classifying a type of interference in one of at least two predetermined classes of interference ("the interference classifier 314 analyzes the signal received from the channel 306 and identifies and classifies interference components within the signal. The interference components can be from any of a number of different sources, such as nearby communications systems and/or hostile entities attempting to jam transmissions from the transmitter 312. The interference classifier 314 outputs a signal indicative of the interference classification of each of the identified interference components" (Col. 3, lines 39-51)).

As to claims 2 and 13 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal and method, wherein a first class of interference includes inter-cell interference and that a second class of interference includes intra-cell interference ("the interference classifier 314 analyzes the signal received from the channel 306 and identifies and classifies interference components within the signal. The interference components can be from any of a number of different sources, such as nearby communications systems and/or hostile entities attempting to jam transmissions from the transmitter 312. The interference classifier 314 outputs a signal indicative of the interference classification of each of the identified interference components" (Col. 3, lines 39-51). "Interference source 40 represents the sources of all man-made interference in the channel 16. For example, interference source 40 can include partial

band noise jammers, spread spectrum co-channel sources, wide-band noise jammers, bauded co-site signal sources, chirp jammers, multitone jammer, non-bauded co-site signals, and others" (Col. 5, lines 52-58)).

As to claim 3 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to any one of claims 1 and 2, wherein the mobile communications terminal comprises first means with selected signals for adaptively regulating the amplitude of signals processed by the electronic circuit ("FIG. 3 is a block diagram illustrating the disturbance classification unit 74 in one embodiment of the present invention. As illustrated, the disturbance classification unit 74 includes a feature extraction unit 80 and a classifier 92" (Col. 9, lines 16-19). "The classifier 92 outputs a signal that is indicative of the type of interference in the received signal. Such classification can include, but is not limited to, the following bauded and unbauded signals of interest: Amplitude Modulation, PAM, ..." (Col. 9, line 63 to Col. 10, line 20)).

As to claim 4 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 3, wherein the first means includes Automatic Gain Control means ("the procedure outlined in the flowchart of FIG. 20 can also be used for processing gain adaptation. That is, instead of changing the hop sequence in step 170, the processing gain parameters determined by the processing gain adaptation module 36 can be changed based on the identified interference signals. In general, new processing gain parameters will be chosen to minimize the effect of the identified interference" (Col. 18, lines 6-13)).

As to claim 5 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 3, wherein the first means includes means

with selected signals for communicating commands of controlling transmitted power with a base station capable of communicating with a multitude of mobile communications terminals ("the interference suppression processor 42 delivers signals back to the FH adaptation module 34 and the processing gain adaptation module 36 in the transmitter that are indicative of interference type and spectral location" (Col. 7, lines 35-38). "The processing gain adaptation module 36 receives feedback signals from the receiver 18 that are indicative of the type(s) and spectral location(s) of interference presently in the channel 16. The processing gain adaptation module 36 uses this information to determine an appropriate processing gain for the transmit signal in light of the identified interference" (Col. 5, lines 26-32)).

As to claim 6 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 1, wherein the mobile communications terminal comprises second means with selected signals for monitoring the communications quality ("performance estimator 66 receives the reconstructed data from the decoder 60 and analyzes the data to calculate one or more performance metrics. These performance metrics are then transferred back to the interference suppression processor 42 for use in fine tuning the interference suppressor function. In a preferred embodiment, signal to noise ratio (SNR), bit error rate (BER), and spectral distortion (SD) are used as performance metrics, although other metrics may also be used" (Col. 7, lines 22-30)).

As to claim 7 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 6, wherein the second means includes means for monitoring the signal strength of the received signal ("performance estimator 66 receives the reconstructed data from the decoder 60 and analyzes the data to calculate one or

more performance metrics. These performance metrics are then transferred back to the interference suppression processor 42 for use in fine tuning the interference suppressor function. In a preferred embodiment, signal to noise ratio (SNR), bit error rate (BER), and spectral distortion (SD) are used as performance metrics, although other metrics may also be used" (Col. 7, lines 22-30)).

As to claim 8 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 6, wherein the second means includes means for monitoring a signal-to-interference ratio of the received signal ("performance estimator 66 receives the reconstructed data from the decoder 60 and analyzes the data to calculate one or more performance metrics. These performance metrics are then transferred back to the interference suppression processor 42 for use in fine tuning the interference suppressor function. In a preferred embodiment, signal to noise ratio (SNR), bit error rate (BER), and spectral distortion (SD) are used as performance metrics, although other metrics may also be used" (Col. 7, lines 22-30)).

As to claim 9 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 1, wherein:

the mobile communications terminal comprises means for processing the communication signal in a first of at least two ways ("the targeted interference suppression unit 78 includes a library of software modules that are each capable of suppressing or removing undesired interference components from a subject signal. Each of the modules in the targeted interference suppression unit 78 works best with a particular type or class of interference/jamming. For example, one module may be best at suppressing spread spectrum co-channel signals while

another is best at suppressing the effects of frequency selective fading. The targeted interference suppression unit 78 receives the classification output signal form the disturbance classification unit 74 and the parameter signals from the jammer parameter extraction unit 76 and uses this information to determine which module is best for suppressing the interference in the receive signal" (Col. 8, lines 9-22)); and

the first way is selected from the at least two ways in dependence on a classified type of interference (see Col. 8, lines 9-22).

As to claim 10 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 1, wherein the mobile communications terminal comprises filter means f' for processing the communication signal by means of a set of filter coefficients Θ selected in dependence of a classified type of interference (see Col. 18, line 49 to Col. 19, line 5).

As to claim 11 (CURRENTLY AMENDED), the Bergstrom reference discloses the mobile communications terminal according to claim 10, wherein:

the filter means is a low-pass filter ("the targeted interference suppression unit 78 includes a plurality of interference suppression modules that can be used to suppress interference/jamming components within the receive signal" (Col. 16, lines 10-13). "These techniques are (1) the inverse whitening function technique, (2) the adaptive inverse weight technique, and (3) the adaptive excision technique" (Col. 16, lines 17-19). See also "adaptive inverse weight" in Col. 19, line 50 to Col 20, line 30, and Figures 17 and 23);

the filter has a relatively high band-width when interference is classified to be intra-cell interference (see "adaptive inverse weight" in Col. 19, line 50 to Col 20, line 30, and Figures 17 and 23); and

the filter has a relatively low band-width when interference is classified to be inter-cell interference ("the inverse whitening function suppression method makes use of the fact that direct sequence spread spectrum data transmissions generally have a spectrum similar to that of band limited white noise. Based on this fact, perturbations in the channel serve to color or distort the spectral characteristic of the channel from this white noise model. The inverse whitening function removes this distortion from the white noise model" (Col. 18, lines 35-40). "The inverse whitening function interference suppression method can be used to suppress a wide range of narrowband and partial band interference type, including tones, communication signals, and jammers" (Col. 19, lines 39-43)).

As to claim 12 (CURRENTLY AMENDED), the Bergstrom reference discloses in a mobile communications terminal adapted for use in a cellular communications system (see Figure 1), a method comprising

receiving a wire-less communications signal carrying signal channels ("the receiver 304 includes an interference classifier 314, an interference suppressor 316, and a demodulation/decoding unit 318. The receiver 304 receives the signal from the channel 306 in a signal receptor (not shown), such as an antenna. The interference classifier 314 analyzes the signal received from the channel 306 and identifies and classifies interference components within the signal" (Col. 3, lines 39-45)); and

extracting the signal channels via an electronic circuit (see Col. 3, lines 39-45); and

classifying a type of interference; affecting the communications quality, by evaluating signals selected in the electronic circuit as signals having information for classifying a type of interference in one of at least two predetermined classes of interference ("the interference classifier 314 analyzes the signal received from the channel 306 and identifies and classifies interference components within the signal. The interference components can be from any of a number of different sources, such as nearby communications systems and/or hostile entities attempting to jam transmissions from the transmitter 312. The interference classifier 314 outputs a signal indicative of the interference classification of each of the identified interference components" (Col. 3, lines 39-51)).

As to claim 14 (CURRENTLY AMENDED), the Bergstrom reference discloses the method according to any one of claims 12 and 13, the method further comprises:

processing the communication signal in a first of at least two ways ("the targeted interference suppression unit 78 includes a library of software modules that are each capable of suppressing or removing undesired interference components from a subject signal. Each of the modules in the targeted interference suppression unit 78 works best with a particular type or class of interference/jamming. For example, one module may be best at suppressing spread spectrum co-channel signals while another is best at suppressing the effects of frequency selective fading. The targeted interference suppression unit 78 receives the classification output signal form the disturbance classification unit 74 and the parameter signals from the jammer parameter extraction unit 76 and uses this information to determine which module is best for suppressing the interference in the receive signal" (Col. 8, lines 9-22)); and

wherein the first way is selected from the at least two ways in dependence on a classified type of interference (see Col. 8, lines 9-22).

As to claim 15 (CURRENTLY AMENDED), the Bergstrom reference discloses the method according to claim 12, comprising:

filtering the communication signal with a low-pass filter ("the targeted interference suppression unit 78 includes a plurality of interference suppression modules that can be used to suppress interference/jamming components within the receive signal" (Col. 16, lines 10-13). "These techniques are (1) the inverse whitening function technique, (2) the adaptive inverse weight technique, and (3) the adaptive excision technique" (Col. 16, lines 17-19). See also "adaptive inverse weight" in Col. 19, line 50 to Col 20, line 30, and Figures 17 and 23);

wherein the filter has a relatively high band-width when interference is classified to be intra-cell interference (see "adaptive inverse weight" in Col. 19, line 50 to Col 20, line 30, and Figures 17 and 23); and

wherein the filter has a relatively low band-width when interference is classified to be inter-cell interference ("the inverse whitening function suppression method makes use of the fact that direct sequence spread spectrum data transmissions generally have a spectrum similar to that of band limited white noise. Based on this fact, perturbations in the channel serve to color or distort the spectral characteristic of the channel from this white noise model. The inverse whitening function removes this distortion from the white noise model" (Col. 18, lines 35-40). "The inverse whitening function interference suppression method can be used to suppress a wide range of narrowband and partial band interference type, including tones, communication signals, and jammers" (Col. 19, lines 39-43)).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

d. Brommer (U.S. Patent 6,233,443) discloses apparatus and method for reducing co-channel radio interference.

e. Skold et al. (U.S. Patent 5,933,768) discloses receiver apparatus, and associated method, for receiving a receive signal transmitted upon a channel susceptible to interference.

f. Bar-Ness (U.S. Patent 6,137,785) discloses wireless mobile station receiver structure with smart antenna.

g. Madkour et al. (U.S. Patent 6,574,270) discloses baseband interference canceling spread spectrum communications methods and apparatus.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Duy Le
April 16, 2004

Quochien B. Vuong 4/18/04.

QUOCHIEN B. VUONG
PRIMARY EXAMINER